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DESCRIPTION

CONTAINER SUSPENDING DEVICE

5 TECHNICAL FIELD

This invention relates to a container suspending device used for drinks or the like filled in a container such as a can or a plastic bottle when the drinks are sold in a bundle or carried about.

10 BACKGROUND ART

In retail stores, generally, canned drinks such as canned beer, juice or coffee as well as bottled tea, juice, isotonic drinks or flavoring materials filled in plastic bottles are sold individually or in a bundle of a certain number of items. On the other hand, when canned drinks or bottled drinks in plastic bottles are delivered from manufacturers or wholesale stores to retail stores, they are packaged in a pack of a certain number of items. For example, 24 cans of beer are delivered by packaging 6 cans each in auxiliary containers and then packaging the auxiliary containers in a corrugated carton. Thus, in retail stores, the corrugated carton is opened to take out a canned beer one at a time for individual sales, or several cans of beer are displayed by setting them in a specially designed portable carton or 20 a suspending device for sales in a bundle.

An example of the above-described portable carton is disclosed in published Japanese Utility Model Registration No. 2553133 (Patent Document No. 1). In this portable carton, carton blanks made of paperboards are assembled to house 6 cans of beer.

An example of the above-described suspending device is a device disclosed in 25 published Japanese Patent No. 2859165 (Patent Document No. 2). With this suspending

device, a cap-shaped fitting portion having a shape to accommodate an upper portion of a can is formed at six positions on a main body made of synthetic resin. On an inner peripheral wall of a depressed portion on a rear side of the fitting portion, a plurality of lock pieces rising aslant toward an inner side are formed in a circumferential direction. By this structure, 6 cans of beer can be lifted up and carried at one time, and also can be stacked.

By using the portable carton or suspending device described above, a large number of canned beers can be neatly arranged and displayed at a store in a unit of six. However, the conventional portable carton and the suspending device have the following problems.

The portable carton disclosed in Patent Document No. 1 as above can be easily manufactured because it can be made by simply assembling carton blanks made of paperboard, whereas the carton with canned beers housed therein cannot be vertically stacked. As a result, the cartons with canned beers can only be horizontally arranged for display on a shelf or a table. Thus, the carton is convenient as a carrier but no better than the case where a canned beer is individually sold in terms of effective use of store space. Moreover, it is quite troublesome to transfer canned beers that are delivered in a corrugated carton to the portable carton one at a time.

The suspending device disclosed in Patent Document No. 2 as above is manufactured at lower cost, and canned beers in a corrugated carton can be easily set in the suspending device. Furthermore, as six canned beers set in the suspended device can be vertically stacked, the device is also superior in terms of effective use of store space. Nevertheless, the suspending device made of synthetic resin can cause problems with regard to waste treatment after use as with other synthetic resin waste.

On the other hand, drinks in plastic bottles are not usually purchased in a bundle when an individual carries about a bottle and consumes it within a day. However, they are sometimes sold in a bundle for promotion in a special sale or for convenience of a family or

group purchase. In this case, if 2, 4 or 6 bottles are sold in a bundle, a customer can hang the bottles in his/her hand to carry them to a cashier or bring them back home, and then sales quantity is expected to rise.

## 5 DISCLOSURE OF THE INVENTION

An object of the present invention is to provide a container suspending device capable of processing waste without causing any problems while maintaining the advantages of a conventional container suspending device.

A container suspending device according to the present invention comprises a 10 paper container suspending base plate having a plurality of circular openings, and a plurality of lock pieces extending from an inner peripheral edge of each of the circular openings toward an inside. Diameters of the circular openings are formed so that head parts of containers to be suspended can pass therethrough, and diameters of virtual circles formed by connecting tips of the plurality of lock pieces to each other are formed smaller than 15 diameters of lock parts formed on peripheries around the head parts of the containers.

In the present invention, the container suspending base plate is pushed down from the top side of cans of drinks or the like or plastic bottles (referred to as "container" 20 hereinafter) that have been arranged in a bundle of 2, 4 or 6 so that the head parts of the containers fit into the plurality of circular openings, respectively. By further pushing down the container suspending base plate, the plurality of lock pieces pass over the head parts of the containers and reach the lock parts formed on the peripheries around the head parts of the containers. Then, the lock parts bend the lock pieces outward to allow the container suspending base plate to pass downward. After the lock parts on the head parts of the containers pass, the lock pieces unbend inward by resilience. Thus, the tips of the lock 25 pieces are positioned under the lock parts on the head parts of the containers, thereby

preventing the lock parts from slipping out.

The container suspending device of the present invention is made of paper. Accordingly, the device can be reused and also does not cause any problems when processing waste because it can be burnt without generating any toxic gas.

5        The lock pieces as described above may horizontally extend from the inner peripheral edges of the circular openings toward the insides thereof. Preferably, they may rise aslant from the inner peripheral edges of the circular openings toward the insides. In this structure, when the head parts of the containers fit into the circular openings, the plurality of lock pieces which rise aslant form funnel-shapes to serve as guides so that the 10 container suspending base plate is guided by the head parts of the containers so as to automatically bring the centers of the circular openings to the centers of the head parts of the containers. Thus, even when the container suspending base plate is pushed onto the plurality of head parts of the containers at the same time, the head parts of the containers are automatically positioned at the centers of the circular openings, thereby facilitating the 15 assembly.

Here, it is difficult to form the lock pieces rising aslant from flat paper blanks. However, by employing pulp molding, the entire body of the suspending device including the lock pieces rising aslant can be easily fabricated by one-time molding.

20      The container suspending device according to the present invention is used for taking out 2, 4 or 6 products as a unit from a case containing 24 products when they are sold in stores. In addition, when shipping out drinks or the like from plants, by attaching the device to the products in advance, the products can be easily taken out from a case containing 24 products and also displayed in stores efficiently.

25      In the container suspending device of the present invention, a simple structure only with the container suspending base plate can be employed whereas the device may further

comprises a paper top plate bonded on the upper side of the container suspending base plate, in which cap-shaped fitting parts are formed at the positions which correspond to the circular openings. The cap-shaped fitting parts cover the head parts of the containers in order to protect the head parts of the containers or to enhance stability when stacking up the 5 container suspending devices. The top plate can also be fabricated by pulp molding.

The base plate and the top plate of the container suspending device are processed with at least one of either water-resistant or water-repellent finish.

It is because, when canned beer or plastic bottles set in the container suspending device are stored in a refrigerator and then taken out to be exposed to the outside air, the 10 base plate or top plate of the container suspending device, which is made of paper or fabricated by pulp molding, is affected by dew condensation to reduce its strength. Application of at least one of either water-resistant or water-repellent finish prevents moisture from penetrating the inside of the paper materials, thereby maintaining integrity of the strength.

15 The present invention exhibits the following effects.

The container suspending device of the present invention comprises a paper container suspending base plate having a plurality of circular openings, and a plurality of lock pieces extending from an inner peripheral edge of each of the circular openings toward an inside, in which diameters of the circular openings are formed so that head parts of 20 containers to be suspended can pass therethrough, and diameters of virtual circles formed by connecting tips of the plurality of lock pieces to each other are formed smaller than diameters of lock parts formed on peripheries around the head parts of the containers. By this structure, once the lock parts on the head parts of the containers pass through, the lock pieces unbend inward by resilience, preventing the lock parts from slipping out. The 25 container suspending device of the present invention is made of paper. Accordingly, the

device can be reused and also does not cause any problems when processing waste because it can be burned without generating any toxic gas.

Moreover, the container suspending device is provided with a plurality of lock pieces rising aslant from the inner peripheral edges of the circular openings toward the insides thereof. Therefore, when the head parts of the containers pass through the openings, the plurality of lock pieces which rise aslant toward the insides of the openings form funnel-shapes to serve as guides so that the container suspending base plate can be fitted so as to automatically bring the centers of the circular openings to the centers of the head parts of the containers.

10 By employing pulp molding, the entire body of the suspending device including the lock pieces rising aslant can be easily fabricated by one-time molding.

The container suspending device of the present invention can bundle a plurality of containers when they are sold in stores so that a customer can bring back the containers in a bundle to home. In addition, when shipping out drinks or the like from plants, by attaching 15 the device to the products in advance, the products can be easily taken out from a case containing a number of products and also displayed in stores efficiently.

The container suspending device of the present invention, in addition to the use of the container suspending base plate alone, can also be used with a paper top plate bonded on the upper side of the container suspending base plate, in which cap-shaped fitting parts are 20 formed at the positions which correspond to the circular openings. The cap-shaped fitting parts cover the head parts of the containers in order to protect the head parts of the containers or to enhance stability when stacking up the container suspending device. The top plate can also be fabricated by pulp molding.

By processing the container suspending device and the top plate with at least one of 25 either water-resistant or water-repellent finish, even when the device is taken out from a

refrigerator after storing it, dewdrops do not penetrate the inside of the paper materials to reduce its strength. Therefore, the device can be conveyed without being damaged during the transportation.

## 5 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1A is a perspective view taken from a top side of a container suspending device of a first embodiment of the present invention, and Fig. 1B is a perspective view taken from a bottom side of the same container suspending device.

Fig. 2A is an exploded view of a top plate of the container suspending device of Fig. 1, and Fig. 2B is an exploded view of a container suspending base plate.

Fig. 3A is an end view taken along the line A-A of Fig. 1A, and Fig. 3B is an end view taken along the line B-B of Fig. 1B.

Fig. 4 is a drawing illustrating a state of an upper end portion of a can fixed in a fitting portion of the container suspending device of Fig. 1.

Fig. 5A is a plan view of a container suspending base plate which constitutes a container suspending device of a second embodiment of the present invention, and Figs. 5B and 5C are sectional views taken along the lines C-C and D-D in Fig. 5A, respectively.

Fig. 6 is a perspective view illustrating a structure of a top plate that is to be combined with the container suspending base plate of the second embodiment of the present invention.

Fig. 7 is a sectional view illustrating an outer figure of a can containing drink.

Fig. 8A is a plan view of a container suspending base plate which constitutes a container suspending device of a third embodiment of the present invention, and Fig. 8B is a sectional view taken along the line E-E of Fig. 8A.

Fig. 9A is a plan view illustrating a structure of a top plate that is to be combined

with the container suspending base plate of the third embodiment of the present invention, and Fig. 9B is a sectional view taken along the line F-F of Fig. 9A.

#### BEST MODE FOR CARRYING OUT THE INVENTION

5 Embodiments of the present invention are explained below with reference to the drawings.

##### <First Embodiment>

A first embodiment of the present invention is explained using Figs. 1A, 1B, 2A, 2B, 3A, 3B and 4.

10 A container suspending device in the present embodiment comprises a main body 10 formed by bonding a top plate 11 made of a cardboard and a container suspending base plate 12 with an adhesive agent. On the top plate 11, as shown in Fig. 1A, six octagonal cap bodies 11a to 11f are provided, which are formed by bending a punched cardboard 20 shown in Fig. 2A at bending lines represented by broken lines. On a container suspending 15 base plate 12, six circular openings 12a to 12f with four lock pieces 13a to 13d extending from an inner periphery toward an inside of each of the circular openings 12a to 12f as shown in Fig. 1B. The container suspending base plate 12 is formed by bending a punched cardboard 30 shown in Fig. 2B at bending lines represented by broken lines.

Each of the lock pieces 13a to 13d is continuously formed with a cardboard body 20 31 integrally. The circular openings 12a to 12f, the lock pieces 13a to 13d, and the cap bodies 11a to 11f of the top plate 11 constitute cap-formed fitting parts 14a to 14f (see the reference numeral 14a in Fig. 3A). As shown in Fig. 3A, when the fitting part 14a (and 14b to 14f, similarly) is not mounted on a can C, each of the lock pieces 13a to 13d extends in a horizontal direction toward an inner side of a recess 15A on a rear side of the fitting part 25 14a.

At a portion where the circular openings 12a to 12f are adjacent to each other, since the width of a marginal portion 32 of the cardboard body 31 is small and fragile, a reinforcing part 21 is formed by bending a corresponding portion of the cardboard 20 of the top plate 11 in a horseshoe form as shown in Fig. 3B.

5 When the fitting portions 14a (and 14b to 14f, similarly) to 14f (and 14b to 14f, similarly) are mounted on the can C, as shown in Fig. 4, the lock pieces 13a to 13d are pressed by an upper end of the can C to elastically deform upwardly. After the upper end of the can C has passed through, an end portion of an edge of the upper end of the can C is fixed in contact with tips of the lock pieces 13a to 13d.

10 The suspending device can be easily mounted to the can C simply by pressing the fitting part 14a onto an upper portion of the can C. Also, the device can be easily removed only by detaching the fitting part 14a from the can C while bending the fitting part 14a by using its elasticity. When the can C is pulled downward, the lock pieces 13a to 13d are readily elastically deformed downward so that the tips of the lock pieces 13a to 13d depart 15 from the edge of the upper end of the can, thereby removing the can C.

In the container suspending device of the present embodiment, as in the suspending device described in published Japanese Patent No. 2859165 mentioned above, the can C, such as a canned beer, that is contained in a corrugated carton is easily set in the suspending device. Moreover, since six of the cans C such as beer set in the suspending device can be 20 stacked in a vertical direction, it is also superior in terms of efficient use of store space. In addition, the suspending device made of paper causes any problems in processing waste after use.

25 In the present embodiment, the top plate 11 is made from a cardboard member formed by bending the punched cardboard 20, and the cap bodies 11a to 11f have an octagonal form as a matter of convenience for the bending process. If, however, the top

plate is made from a pulp mold member, the cap bodies may have a circular form because the cap bodies can be easily formed in such a case. Also on a top surface of each of the cap bodies 11a to 11f, a concave-convex portion that fits a bottom shape of the can C may be provided so that another can C can be stably stacked on the suspending device mounted 5 to the can C. The number of the lock pieces 13a to 13d of the container suspending base plate 12 is not limited to four, but may be three or five and over.

<Second Embodiment>

A second embodiment of the present invention is explained using Fig. 5. Fig. 5A is a plan view of a container suspending base plate 10, and Figs. 5B and 5C are sectional 10 views taken along the lines A-A and B-B in Fig. 1A, respectively.

In the present embodiment, an example of suspending six drink cans is illustrated.

The container suspending base plate 40 has six circular openings 41, and a plurality of lock pieces 42 are formed to rise aslant from an inner peripheral edge of each of the circular openings 41 toward an inside thereof. Diameters D1 of the circular openings 41 15 are formed so that head parts of cans to be suspended can pass therethrough, and diameters D2 of virtual circles formed by connecting tips of the lock pieces 42 to each other are formed smaller than diameters of lock parts (a) formed on peripheries around the head parts of the cans (see Fig. 7). The container suspending base plate 40 has a frame portion 43 therearound for reinforcement and a finger catching flap 44 at two positions in a central area 20 for inserting a finger. A ring-formed rim 45 is formed around the finger catching flap 44 in order not to hurt a finger with a peripheral edge touching around the finger when inserting the finger.

The container suspending base plate 40 is fabricated by pulp molding so as to integrally form the lock pieces 42, the frame portion 43 and the finger catching flap 44 25 without employing press molding.

At a beverage plant or the like, the container suspending base plate 40 with the above structure can be used to put together cans in a unit of six. In a production line, cans are conveyed being aligned in a unit of six, and the container suspending base plate 40 is set on the six cans that have been tightly arranged together and conveyed. Then, the container 5 suspending base plate 40 is pressed with a flat-type pushing jig or with a rotary-type jig capable of pressing the container suspending base plate 40 while the six cans are being tightly arranged together and conveyed. The positions of the circular openings 41 can be imprecisely adjusted because the plurality of lock pieces 42 around the inner periphery of the circular opening 41, which are arranged to form a reverse funnel shape, guide the 10 periphery around the head part of the can so that the container suspending device 40 can be automatically adjusted to the position of the can at the center.

Next, the container suspending base plate 40 is strongly pushed down. Then, after the lock pieces 42 are pushed outward by the lock part (a) of the can C, the tips of the lock pieces 42 return toward the inside by resilience and are fixed to the periphery of the lock 15 part (a) at a lower side thereof. Thus, the lock part (a) of the can C does not slip or fall out downwardly. The cans put together in a unit of six in this manner can be conveyed as in the state and housed in a corrugated carton for transport. Also in stores, the container suspending base plate 40 can be set on six cans closely arranged together in a unit of six and pressed with a simple flat-type jig so that the six cans can be easily put together at one time.

20 The container suspending device of the present invention, as shown in Fig. 6, in addition to the use of the container suspending base plate 40 alone, can also be used with a paper top plate 50 bonded on an upper side of the container suspending base plate 40, in which cap-shaped fitting parts 51 are formed at the positions which correspond to the circular openings 41. The cap-shaped fitting parts 51 cover head parts of the cans in order 25 to protect the head parts of the cans or to enhance stability in the case that the cans are

stacked up. On a top face of the fitting part 51, a groove 51A to catch a rib portion b (See Fig. 7) formed on a periphery of a bottom of the can C can be formed so as to have functions of positioning the cans to be stacked on the top and preventing a slip in a horizontal direction. Furthermore, the top plate 50 is provided with a second finger catching flap 52 at the position corresponding to the position of the finger catching flap 44 formed in the container suspending base plate 40. Accordingly, when the container suspending base plate 40 is bonded with the top plate 50 in use, both of the finger catching flaps 44 and 52 are bent downward at the same time to lift up the cans.

The top plate 50 can also be fabricated by pulp molding.

10 <Third Embodiment>

A third embodiment of the present invention is explained using Figs. 8A and 8B.

In the present embodiment, an example of suspending six plastic bottles P is illustrated.

A container suspending base plate 60 has six circular openings 61, and a plurality of lock pieces 62 are formed to rise aslant from an inner peripheral edge of each of the circular openings 61 toward an inside thereof. Diameters D3 of the circular openings 61 are formed so that head parts of the plastic bottles P to be suspended can pass therethrough, and diameters D4 of virtual circles formed by connecting tips of the plurality of lock pieces 62 to each other are formed smaller than diameters of lock parts (d) (See Fig. 8B) formed on peripheries around the head parts of the plastic bottles P. The container suspending base plate 60 has a frame portion 63 therearound for reinforcement and a finger catching flap 64 at two positions in a central area for inserting a finger.

The container suspending base plate 60 is fabricated by pulp molding so as to integrally form the lock pieces 62, the frame portion 63 and the finger catching flap 64 without employing press molding.

In this case, a water repellent agent for water-repellent finishing is added to pulp stock solution for pulp molding. As the water repellent agent, general materials such as a wax emulsion, a silicone emulsion, and a polyolefin derivative can be employed. The amount to be added is an amount with which a 500-ml can mounted to a pulp molded 5 product does not fall out in a vibration test and a twist test after the product is stored in a room with a relative humidity of 90% and a temperature of 35°C for 24 hours.

When a wax emulsion is employed as a water repellent agent, for example, the wax emulsion is added to a pulp stock solution by 10 to 20 wt.% as a solid content relative to an absolute dry pulp. A desired strength could not be obtained with the amount less than 10 10 wt.% due to moisture absorption, and the amount more than 20 wt.% did not provide a pulp mold product in a dried condition with strength.

At a beverage plant or the like, the container suspending base plate 60 with the above structure can be used to put together plastic bottles in a unit of six. In a production line, plastic bottles are conveyed being aligned in a unit of six, and the container suspending 15 base plate 60 is set on the six plastic bottles that have been tightly arranged together and conveyed. Then, the container suspending base plate 60 is pressed with a flat-type pushing jig or with a rotary-type jig capable of pressing the container suspending base plate 60 while the six cans are being tightly arranged together and conveyed. The positions of the circular openings 61 can be imprecisely adjusted because the plurality of lock pieces 62 around the 20 inner periphery of the circular opening 61, which are arranged to form a reverse funnel shape, guide the periphery around the head part of the plastic bottle so that the container suspending device 60 can be automatically adjusted to the position of the plastic bottle at the center.

Next, the container suspending base plate 60 is strongly pushed down. Then, after 25 the lock pieces 62 are pushed outward by the lock part (d) of the plastic bottle P, the tips of

the lock pieces 62 return toward the inside by resilience and are fixed to the periphery of the lock part (d) at a lower side thereof. Thus, the lock part (d) of the plastic bottle P does not slip out downwardly. The plastic bottles put together in a unit of six in this manner can be conveyed as in the state and housed in a corrugated carton for transport. Also in stores, the 5 container suspending base plate 60 can be set on six plastic bottles closely arranged together in a unit of six and pressed with a simple flat-type jig so that the six plastic bottles can be easily put together at one time.

The container suspending device of the present invention, as shown in Figs. 9A and 9B, in addition to the use of the container suspending base plate 60 alone, can also be used 10 with a paper top plate 70 bonded on an upper side of the container suspending base plate 60, in which cap-shaped fitting parts 71 are formed at the positions which correspond to the circular openings 61. The cap-shaped fitting parts 71 cover head parts of the plastic bottles in order to protect the head parts of the plastic bottles or to enhance stability in case the plastic bottles are stacked up. The top plate 70 is provided with a second finger catching 15 flap 72 at the position corresponding to the position of the finger catching flap 64 formed in the container suspending base plate 60. Accordingly, when the container suspending base plate 60 is bonded with the top plate 70 in use, both of the finger catching flaps 64 and 72 are bent downward at the same time to lift up the plastic bottles.

The top plate 70 can also be fabricated by pulp molding as in the container 20 suspending base plate 60.

Whereas the above-described first to third embodiments illustrate cans or plastic bottles put together in a unit of six, the present invention can be similarly applied to cans or plastic bottles put together in a unit of other numbers such as two or four.

## INDUSTRIAL APPLICABILITY

According to the present invention, a container suspending device used for drinks or the like filled in a container such as a can or a plastic bottle when the drinks are sold in a bundle or carried about, can be used in a manner of causing no problems in waste treatment.